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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,942	12/01/2003	Christopher W. Coldren	G&C 122.46-US-UI	3260
22462	7590	06/24/2005	EXAMINER	
GATES & COOPER LLP HOWARD HUGHES CENTER 6701 CENTER DRIVE WEST, SUITE 1050 LOS ANGELES, CA 90045			KIANNI, KAVEH C	
			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 06/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/724,942

Applicant(s)

COLDREN ET AL.

Examiner

Kianni C. Kaveh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 8-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,5 and 7 is/are rejected.
- 7) ☒ Claim(s) 2,3 and 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

This application contains claims directed to the following patentably distinct species of the claimed invention: I) claims 1-7 are directed to a first lightwave with a first wavelength creates an electrical signal in the PD 544 that propagates along a first interconnecting electrical transmission line to the modulator, related to first embodiment shown in fig. 1; II) claims 8-14 are directed to wherein the TWPD and TWM are positioned side-by-side within an interconnecting electrical transmission line such that an electrical signal generated by the TWPD in response to an input signal on a first lightwave with a first wavelength simultaneously propagates along the TWM related to the second embodiment shown in fig. 2; III) claims 15-19 are directed to wherein an input signal modulated onto a first optical wavelength develops a traveling wave voltage on transmission line electrodes of the TWPD, and the traveling wave voltage is coupled via a first interconnecting electrical transmission line to transmission line electrodes of the TWM in order to modulate the input signal onto a second optical wavelength derived from the tunable laser, and the traveling wave voltage continues to propagate along a second interconnecting electrical transmission line related to another embodiment shown in fig. 7-8. Thus, each of the above embodiments have at least one limitation that is not found in other embodiments and in which each invention requires a different search than that of other inventions.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none of the claims are generic.

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Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

During a telephone conversation with Mr. Gate on 6/14/05 a provisional election was made with traverse to prosecute the invention of Group I invention, claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-19 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites 'a monolithic wavelength converter assembly using a common layer structure and including a widely-tunable laser, traveling-wave photodetector TWPD and Traveling-wave modulator TWM'. The scope of the invention is ambiguous as what the product is comprised of, since the preamble of the invention is indistinguishable from that of the elements comprising the product. Correction is required.

***Allowable Subject Matter***

Claims 2, 3 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the

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base claim, in which does no longer rejected under 35U.S.C 112, and any intervening claims.

Claim 2 is allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein an electrical impedance of the TWPD, the first and second interconnecting electrical transmission lines, and TWM all are equal to RL in combination with the rest of the limitations of the base claim.

Claim 3 is allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein an electrical impedance of the TWPD, first and second interconnecting electrical transmission lines, TWM and RL are different, but are chosen to maximize an optical-to-optical signal conversion efficiency or output signal level in combination with the rest of the limitations of the base claim.

Claims 6 are allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein an effective bandgap of an absorber within the TWPD is decreased from larger than a photon energy to lower than the photon energy from an input to an output of the TWPD in combination with the rest of the limitations of the base claim.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 4-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maleki et al. (US 20020018611).

Regarding claims 1 and 4-5, Maleki teaches a monolithic wavelength converter assembly (shown in fig. 5; see parag. 0039) using a common layer structure (see parag. 0046) and including a widely-tunable laser 530, optical-wave photodetector PD 544 and optical-wave modulator 532, wherein an input signal 540 on a first lightwave with a first wavelength creates an electrical signal in the PD 544 that propagates along a first interconnecting electrical transmission line to the modulator 532 (see electric line coming off PD 544 toward modulator 532), where the electrical signal is imprinted onto a second lightwave with a second selectable wavelength derived from the widely-tunable laser 530 (see parag. 0039), and the electrical signal continues to propagate along a second interconnecting electrical transmission line 526.

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Maleki further teaches a semiconductor optical amplifier (SOA) to preamplify the input signal to improve electrical signal level, modulation extinction, output optical signal level or wavelength conversion efficiency (see parag. 0043).

However, Maleki does not specifically teach wherein the above transmission line is coupled to a load resistor, and the above optical-wave detector and the modulator are, respectively, high saturation traveling-wave detector and traveling wave modulator, and the above SOA is preceding the PD . Nevertheless, Maleki states that the SOA can be placed any where in along the loop 540 (see parag. 0043). Thus, It would have been obvious to a person of ordinary skill in the art when the invention was made to place the SOA before PD, and couple the electrical signal output 526 to a load resistor, and as a matter of component choice for optimum signal output to use conventional traveling wave PD and modulator since such use of load resistor, photodiodes and modulators are conventional and because the resultant monolithic wavelength converter would provide optimized signal output and/or as means for analyzing output signals (see parag. 0006 and 0013).

Regarding claim 7, Maleki teaches wherein the wavelength converter assembly provides for optical signal regeneration without using electronic circuits(see fig. 5, item SOA and parag. 0043; wherein optical signal is regenerated by SOA, which analogous to applicant's teaching/definition of such limitation in the specification).



***Citation of Relevant Prior Art***

Prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In accordance with MPEP 707.05 the following references are pertinent in rejection of this application since they provide substantially the same information disclosure as this patent does. These references are:

Tanaka et al. 5715075 teaches at least claim 1

Sun et al. 20040145026 and the prior art provided by the applicant teaches high saturation TWPD

Iwaoka et al. 4856899 and the prior art provided by the applicant and Mazur et al.

2003/0029495 and Kurokawa et al. 5263108 and teaches electric current to load resistor

Kellar 6700517 and the prior art provided by the applicant teach TWM

These references are cited herein to show the relevance of the apparatus/methods taught within these references as prior art.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Cyrus Kianni whose telephone number is (571) 272-2417.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (571) 272-2415.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 872-9306 (for formal communications intended for entry)

**or:**

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Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

A handwritten signature in black ink, consisting of a stylized 'K' followed by a long horizontal line.

K. Cyrus Kianni  
Primary Patent Examiner  
Group Art Unit 2883

June 20, 2005